

Amendments to the Drawings:

The drawing sheet or sheets attached in connection with the above-identified application containing Figure(s) 1-15 are being presented as a new formal drawing sheet or sheets to be substituted for the previously submitted drawing sheet or sheets. The drawing Figures 1-2 have been amended. Appended to this amendment is an annotated copy of the previous drawing sheet which has been marked to show changes presented in the replacement sheet of the drawing.

The specific changes which have been made to Figure 1-2 are the “Prior Art” labels.

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

I. Introduction

Claims 21-48 are requested to be cancelled. Claims 1, 3, 9, 15 and 16 are currently being amended. Claims 49-56 are being added. Support for the amendments and for the new claims may be found throughout the application, such as in paragraphs 0035, 0042, 0052 and 0059 of the specification and in Figures 4E, 4F and 14. No new matter is added. After amending the claims as set forth above, claims 1-20 and 49-56 are now pending in this application.

II. Objections

The drawings were objected to as being of a poor quality. Applicants note that formal drawings were filed on July 9, 2004 in response to a Notice to File Corrected Application Papers. Applicants respectfully submit that the formal drawings are sufficiently clear to show all elements.

Figures 1-2 were objected to because they are not labeled "prior art". In response, revised Figures 1 and 2 which are labeled "prior art" are submitted herewith.

Claim 16 was objected to because of a typo. Claim 16 has been amended according to the examiner's helpful suggestion.

The abstract was objected to because it contained the word "comprising". In response, an amended abstract is attached as the last page of this Amendment.

III. The Rejections Should Be Withdrawn

Claim 1 has been rejected as being anticipated by Barone. Claim 3 has been rejected as being obvious over Barone. Claims 2 and 4-20 have been rejected as being obvious over Barone in combination with Kaminar. These rejections are respectively traversed.

A. Claim 1

Claim 1 has been amended to recite a Fresnel lens comprising a substantially square focusing portion. In contrast, the specification of Barone does not describe the shape of the focusing portions of the Fresnel lenses 1 and 2. However, Figure 4 of Barone shows lens array 2 having rectangular shaped elements 20a-d, 21a-d and 22a-d. However, these Fresnel lens elements are not square. Thus, Barone does not anticipate claim 1. Furthermore, there is no motivation to make the elements 20, 21 and 22 of Barone square, since neither Barone nor Kaminar disclose any benefit of a square shape for the focusing portion.

B. Claim 3

Claim 3 has been amended to recite “a first means for supporting a photovoltaic cell inside a building façade envelope at a predetermined distance from the Fresnel lens such that the solar radiation is focused onto the photovoltaic cell.” Applicants note that the actual building façade envelope is not a limitation of claim 3. However, since claim 3 is written in means plus function format of 35 USC 112 paragraph 6, the recited function has to be given patentable weight. In other words, in order to anticipate or render obvious claim 3, Barone would have to explicitly teach a means which can support a photovoltaic cell inside building façade envelope.¹

¹ In order to establish a *prima facie* case of unpatentability of a claim containing a section 112 paragraph 6 means plus function element, the examiner must find a prior art element that actually performs the claimed function; it is not enough that the prior art's structure is capable of performing the claimed function when the prior art specifically teaches against performing such a function. See MPEP 2183. For example, the predecessor court to the Federal Circuit stated:

We cannot agree with the board that the [means plus function] claims “merely recite ‘a means’.” They recite a means plus a function which is not to be found in Leutwyler [the prior art reference]. They therefore do not read on that reference and are not anticipated thereby.

The systems of Barone and Kaminar are not located inside a building façade envelope (i.e., such as in a hollow space between two windows in the face of a building). Barone and Kaminar provide no motivation to locate their modules inside a building façade envelope. Thus, claim 3 is considered to be patentable over Barone and Kaminar.

C. Claim 9

Claim 9 has been amended to recite the small size of the module components. These limitations were previously recited in claim 15. Claim 9 has also been amended to recite that the small size of the module components allows the module to be located inside the building façade envelope. As with claim 3, the building façade envelope is not an actual limitation of claim 9, but defines the environment for which the module is adapted.

The Office Action acknowledges that Barone and Kaminar do not disclose the dimensions which were previously recited in claim 15 and are now recited in claim 9. However, the Office Action states that the dimensions of prior claim 15 are a matter of “routine design choice” and “mere change in size”. Applicants respectfully disagree.

The small module size allows the Sun’s rays to be focused to a small area on the photovoltaic cell. For example, the photovoltaic cell radiation receiving area may be 1.5 cm² or less, as recited in present claim 15. This allows the use of a small photovoltaic cell made on a semiconductor wafer by wafer scale deposition techniques. Such cells include cells with single crystal semiconductor active layers and have a much higher conversion efficiency than large solar cells with amorphous or polycrystalline active layers formed on sheet-like glass and metal substrates. For example, single crystal semiconductor active layer cells formed on a semiconductor wafer can convert 15% to 50% of captured solar energy to electricity, as

In re Mott, 194 USPQ 305, 307 (CCPA 1977). The Federal Circuit cited *In re Mott* with approval in *RCA Corp. v. Applied Digital Data Systems, Inc.*, 221 USPQ 385 (Fed. Cir. 1984). On page 389, footnote 5, the court stated

The claims here define the invention in terms of specific “means-plus-function” elements. The limitations which must be met by an anticipatory reference are those set forth in each statement of function. *In re Mott*, 557 F.2d 266, 269, 194 USPQ 305, 307 (CCPA 1977). Such a limitation cannot be met by an element in a reference that performs a different function, even though it may be part of a device embodying the same general overall concept. [Emphasis added].

recited in claim 52. Thus, reducing the size of the module provides a higher conversion efficiency.

Furthermore, the small size of the module allows the module to be placed inside the building façade envelope. In contrast, the much larger modules of Barone and Kaminar are not adapted to fit into the building façade envelope. Therefore, the size recited in claim 9 is not a matter of design choice or mere change in size, but provides a functional difference from the prior art. The size recited in claim 9 provides an increase in the conversion efficiency of the module and allows the module to be located in a building façade envelope.

In contrast, it appears that Kaminar discloses much larger modules having an apparent size of at least several meters. While Kaminar does not describe the type of solar cells used, it appears that these modules may be used with amorphous or polycrystalline active layer solar cells deposited on large glass or metal substrates having a size of several square meters. Such solar cells normally have a much lower conversion efficiency, usually below 15%. Thus, Kaminar apparently does not recognize that by reducing the size of the module, the conversion efficiency can be increased.

D. Claim 53

New claim 53 recites that the back support structure has a substantially pyramidal or a substantially conical shape. Applicants submit that the back support structure of Kaminar is neither pyramidal nor conical.

A pyramidal structure means that all of the sidewalls of the module have to be tapered toward a common vertex or focal point. However, as clearly seen in Figure 1 of Kaminar, the end caps 14 of the modules of Kaminar are not tapered toward the same focal point as the sidewalls (i.e., wall panels) 18. It appears that the end caps 14 actually protrude outwards rather than inwards in the modules. Thus, the back support structure of Kaminar is not pyramidal. Likewise, the back support structure of Kaminar is not conical because it does not have a circular or even an oval cross sectional shape to make a cone.

The present inventors realized that by making the back support structure pyramidal or conical (i.e., where the sidewall(s) extend toward the same vertex or focal point), allows the modules to be easily rotated about two axes of rotation (i.e., the “morning to evening” axis and the “Summer to Winter” axis) to better track the Sun. In other words, since the back end of the back support structure is narrow, it allows the module to be rotated in many directions in tight spaces, such as inside a building façade envelope.

In contrast, the modules of Kaminar are highly elongated with protruding end caps 14. These modules are very difficult to turn about an axis which is not parallel to the module length direction. Thus, Kaminar does not teach or suggest the module of claim 53.

E. Claims 2 and 4-20

With respect to claims 2 and 4-20, there is no motivation to combine Barone and Kaminar. Barone teaches away from a solar cell system which moves to track the Sun because it is complex and costly (see col. 1, lines 30-42 of Barone). The system of Barone relies on a stationary lens array 2 to track the Sun instead.

In contrast, Kaminar teaches a system which rotates to track the Sun. There is no motivation to combine Barone and Kaminar because Barone specifically teaches away from adding components usable to rotate the module to track the Sun because they are costly and complex. Thus, one of ordinary skill in the art would not import components from the rotatable support structure of Kaminar into the stationary system of Barone.

III. Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a

check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 6/8/05

By



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